

# Nucleonica Trainers.....

## **Joseph Magill, Ph.D.**

### Education

PhD in Computational Plasma Physics  
University of Glasgow, 1975

### Summary of Experience

Dr. Magill has more than 20 years experience in nuclear science and is the author of four books, more than 150 scientific publications and 10 patents.

Following a Ph.D. in computer simulation of laser driven fusion processes, he took up a position as theoretical physicist with the European Commission. He is one of the pioneers of the field of laser nuclear science in which nuclear reactions are induced by lasers – thereby offering a simple and inexpensive way of studying nuclear processes without a nuclear reactor or particle accelerator. Dr. Magill was a member of the Technical Working group on ADS and is one of the authors of the report: "A European Roadmap for Accelerator Driven Systems for Nuclear Waste Transmutation". He has acted as consultant to the IAEA in Vienna on Partitioning and Transmutation of Nuclear Waste, and coordinated a European benchmark exercise on radiotoxicity of spent nuclear fuel. Dr. Magill is an author on radiochemistry and nuclear chemistry in the Encyclopedia of Life Support Systems or EOLSS, an interdisciplinary encyclopedia sponsored by UNESCO.



He is currently sector head of Advanced Nuclear Studies and action leader for Knowledge Management, Education and Training at the Joint Research Centre in Karlsruhe, Germany. Dr. Magill is also the JRC representative on Education, Training and Knowledge Management working group of the Sustainable Nuclear Energy Technology Platform (SNETP)

He is the originator of Nuclides 2000, Nuclides.net, and the Nucleonica Nuclear Science Portal. Since 2003 he has been responsible for the organisation of nuclear science training courses based on the use of this internet technology. His current activities also include the management of the Karlsruhe Nuclide Chart – and the publication of the latest 7<sup>th</sup> edition.

## **George Lasche, Ph.D.**

### Education

Ph.D. in Applied Science  
University of California, 1983  
Master of Science in Physics and Nuclear Engineering  
Massachusetts Institute of Technology, 1977  
Master of Business Administration  
Long Island University, 1980  
Bachelor of Science  
U.S. Military Academy at West Point, 1969

### Summary of Experience

Dr. George Lasche has more than 20 years experience in nuclear science and is the author of over 30 peer-reviewed scientific publications, conference papers and patents.

He has served as an Associate Professor of Physics at West Point, and as a research associate at Lawrence Livermore National Laboratory, where he conducted research in laser fusion. He was Principal Investigator for four high altitude balloon experiments in Australia and Antarctica to analyze nuclear radiation from Supernova 1987A, and served as a State Department advisor to the UN inspection teams in Iraq in 1991. From 1992 to 1995 he was the Director of the Electronic Warfare Vulnerability Assessment Laboratory, and subsequently the Director of the High Energy Laser Systems Test Facility, both at White Sands Missile Range, New Mexico.



He is currently a member of the technical staff at Sandia National Laboratories, where he was Project Manager for measurement and analysis of the nuclear radiation environment in container ships at sea. He is best known as the author of the "Cambio" nuclear spectral file translation and analysis software, which is now in use by over 600 analysts worldwide, and has been integrated into the Nucleonica web site. He is the technical chair for the ANSI N42.42 standard on nuclear data file formats, now under revision, and is currently conducting research in applied methods of spectral data analysis for the interdiction of illicit nuclear traffic. He is also serving as a Triage and Secondary Reachback Analyst to assist front line officers with resolution of possible nuclear terrorism activities.

## Mustafa Çağatay TUFAN, Ph.D

### Education

PhD in Nuclear Physics  
Ondokuz Mayıs University, Samsun, TÜRKİYE, 2007

### Summay of Experience

Dr. Tufan started his master course in 1998 and has occupied a Research Assistant position at the department of Physics in the university of Ondokuz Mayıs up to 2009. After his Ph.D. he became an Assistant Professor at the same university. He worked at the Institute of Transuranium Elements between 2006 and 2007 as a Seconded National Expert.

His research interest is interaction of charged particles, especially the theoretical calculations of Stopping Power and Range. He has several papers on this subject, and coded a computer program which calculates Range and Stopping Power in Nucleonica. He lectures Nuclear and Particle Physics, General Physics, Modern Physics and Computer Programming at the university. He currently has several master students and is one of the responsible persons for constructing the Environmental Radioactivity Laboratory in Ondokuz Mayıs University.



## Verena Kleinrath

Verena Kleinrath is a young nuclear physicist from Austria. She graduated from Vienna University of Technology specializing in nuclear and particle physics in summer 2010. Her main research interests include radiation detection and nuclear security.

Throughout the last year of her master studies she worked with the Nucleonica team in Karlsruhe, doing her thesis on the application of Nucleonica tools onto realistic nuclear security issues. The project focused on the prevention of illicit trafficking of nuclear material and included extensive gamma spectrometric experiments that could also be used to validate the Gamma Spectrum Generator and easy Monte Carlo tools. She could present her results at the International Youth Nuclear Congress in South Africa and the IEEE Nuclear Science Symposium in the US.

During her time at the ITU, Verena also had the chance to support the Nucleonica team with the training courses, the gamma library module and the implementation of a nuclide identification program (WESPA) into the nuclear science web portal.

Currently she is pursuing her PhD in nuclear physics and working as a scientist in the Austrian Competence Center for Tribology, where she is investigating non-equilibrium thermodynamics of friction, wear and corrosion using thin layer activation.



## **Rolf Arlt, PhD**

### Education

PhD in Nuclear Physics  
Technical University of Dresden, 1976

### Summary of Experience

Dr. Arlt has more than 40 years experience in nuclear science and applications and is the author of more than 250 scientific-technical publications in this field.

With a PhD in Physics (nuclear spectrometry of short lived radioisotopes produced at the synchrocyclotron in Dubna and absolute fission cross section measurements) he worked at the Technical University of Dresden.

In 1983 Dr. Arlt received an offer to join the Department of Safeguards of the International Atomic Energy Agency in Vienna. In the subsequent decades he worked in the field of development and implementation of new methods for nuclear safeguards and nuclear security. He was also designated Safeguards inspector in several IAEA Member States, where he amongst others supported the development and implementation of gamma spectrometric methods and passive neutron assay for the verification of spent fuel. He has pioneered the introduction of spectrometric CdZnTe detectors coupled to a miniature Multi Channel Analyzer, developed for the IAEA and Euratom under the German Support Programme.

After his retirement he continued to work for the IAEA as Cost Free Expert in the field of Nuclear Security, supported by Germany. He contributed with instruments and procedures for the radiological security of major public events (the 2004 Olympic Summer games in Athens, the 2006 Soccer World Championship in Germany, transferring experience and lesson learned with respect to radiological security to other major public events such as the 2007 Pan American Games in Rio de Janeiro and the 2008 Olympic Summer Games in Beijing).

Recently, after retiring from the IAEA, he contributed with lectures on gamma spectrometry and isotope identification related to nuclear security in Nucleonica nuclear science training courses based on the use of internet technology, developed at the JRC-Karlsruhe.



## **Raymond DREHER, Dipl. d'Ing.**

### Education:

Diplôme d'Ingénieur, option Génie physique  
Institut National des Sciences Appliquées de Lyon, France, 1969

### Summary of Experience:

Raymond Dreher had the opportunity to join the group of Prof. Hertz at the University of Karlsruhe where he acquired a first-hand experience in NMR pulse spectroscopy on the measurement of relaxation times of different alkali nuclides as salts in water solution. Raymond was also involved in the automation of this kind of measurement using programmable mini computers.

Later, Raymond joined a software startup where he was involved in many software projects covering a wide range of areas: automation of an infra-red spectrometer, in the material testing, data acquisition of a mechanical stress test machine, verifying and controlling of a steel production installation using and processing the data from sparks- and arc-spectrometers. Another main

activity was the development of access control systems using different kind of card readers, information systems via intranet, and to the data exchange with payroll systems like Paisy and SAP R/3.

A few years ago, Raymond joined the Nucleonica team at ITU. One of his first tasks was to implement a relational database containing international evaluated datafiles such as JEFF3.1, Nubase 2003, and ICRP68/72, which forms the heart of Nucleonica. Raymond also developed new Nucleonica applications, using the latest web 2.0 technology and web services, and is continuously improving existing modules through the use of Ajax controls and java scripting. Raymond is also involved in the new electronic version of the Karlsruhe Nuclide Chart which is currently under development by the Nucleonica team.



## **Zsolt Soti, PhD**

### Education

MSc Mathematics- Computer Science University of Novi Sad (Yugoslavia)  
PhD in Medical Informatics University of Lübeck (Germany)

### Summay of Experience

At the beginning of his career Dr. Soti designed and optimised complex relational databases on UNIX servers. At 1994 he started to work on medical informatics and developed a Picture Archiving and Communication System for medical images (PACS) at the University of Szeged (Hungary). This was a pioneering project to use standardised formats to send/receive and save medical images. From the archived radiology and nuclear medicine examinations, several web-portals for educational purposes were created.



As of 2001 he continued to design and develop Picture Archiving System for nuclear medicine at the Schleswig-Holstein University in Germany. In that time he started with multidisciplinary research on the mathematical models of quantifications of 4-Dimensional Positron Emission Tomography examinations. He did his doctoral work on that topic. Dr. Soti is author about of 10 scientific publications. He has more than 20 years experiences in computer science. During his professional life he developed, designed and validated several ICT systems. For example, he was involved in projects for disaster recovery of large databases, secure and encrypted network communication, certifications, standardisation and expert judgement of different IT systems and development of different intranet applications.

As of 2009 Dr. Soti is an IT developer at the Joint Research Centre in Karlsruhe, Germany. He works on project related to the Nuclear Training and Knowledge Management Group. His main topics are: radioactive mixture identification based on gamma spectrum analysis and radiation therapy simulations with charged particles. Dr. Soti is technically responsible for standalone and intranet versions of Nucleonica.



## Andrey Berlizov, Ph.D

### Education

PhD in Nuclear and Particle Physics

Institute for Nuclear Research, Kiev, UKRAINE, 1995

Master of Science in Experimental Nuclear Physics

Kiev State University, Kiev, UKRAINE, 1991

### Summay of Experience

Dr. Berlizov has over 20 years experience in nuclear science and applications and is the author of more than 60 scientific publications in this field, including peer-reviewed articles, book chapters and conference papers.

After his PhD on "Two photon emission in electromagnetic transitions of atomic nuclei" Dr. Berlizov worked as a scientific researcher in the Nuclear Physics Department of Kiev State University, where he combined teaching activities with experimental researches in the field of nuclear spectroscopy. In 1997 he shifted to the Institute for Nuclear Research (INR) of the National Academy of Sciences of Ukraine. Since 1998, as a head of the Neutron Activation Analysis Laboratory, Dr. Berlizov has been involved in the trace element analysis of environmental samples and technological materials at the 10 MWt nuclear research reactor WWR-M in Kiev. Since 1999 he has been joining the INR's expert team on the characterization of nuclear and other radiological materials seized from illicit trafficking. Since 2001 he has been working as a deputy head of the Centre for Ecological Problems of Atomic Energy. In the period from 2007 to 2009 he was working at the Institute for Transuranium Elements as a visiting scientist. Since 2004 he is a member of the scientific and advisory board of the Journal of Radioanalytical and Nuclear Chemistry.



Dr. Berlizov's research interests are nuclear spectroscopy, radioanalytical chemistry, non-destructive assay of nuclear materials, environmental radioactivity, nuclear forensics. He is a developer of several measurement systems and techniques, including a system for continuous radiation monitoring of the first loop coolant of power nuclear reactors, for which in 2006 he was awarded a State Prize of Ukraine in Science and Technology. He is also an expert in scientific programming, computer modelling and simulation. In these fields he is particularly known as a developer of the neutron activation analysis prognostic code NAAPRO, of the correlated particle extension of the general purpose Monte Carlo transport code MCNP-CP, and of the web-based Gamma Spectrum Generator in Nucleonica.

## **Maria Wallenius, Ph.D.**

### Education

MSc Radiochemistry – University of Helsinki (Finland)  
PhD in Nuclear Forensics - University of Helsinki (Finland)

### Summay of Experience

Maria Wallenius received her MSc in radiochemistry at the University of Helsinki, Finland in 1994. She worked at the University of Helsinki as a research scientist in the safeguards project (analysis of uranium fuel pellets by potentiometric titration and thermal ionisation mass spectrometer). In 1996 she moved to the Institute for Transuranium Elements (ITU) to study for a PhD in the area of nuclear forensics, and she obtained her PhD in 2001. She continued to work at the ITU as a research scientist developing new methods using mass spectrometry techniques (especially TIMS and ICP-MS) in the field of safeguards and nuclear forensics. Currently she is coordinating the nuclear forensics activities at the ITU.



## **Jean GALY, Ph.D**

### Education

University Diploma in International Nuclear Law  
Montpellier University 1, Montpellier, FRANCE, 2011  
PhD in Nuclear Physics and Reactor Physics  
Université de Provence, Marseille, FRANCE, 1999  
Swedish Licentiate in Nuclear Physics  
Uppsala University, Uppsala, SWEDEN, 1999

### Summay of Experience

Dr. Galy has over 15 years' experience in nuclear science, nuclear data and reactor applications and is the author of more than 40 scientific publications in these fields, including peer-reviewed articles, book chapters and conference papers.

After his PhD on "Investigation of the fission yields of the fast neutron-induced fission of  $^{233}\text{U}$ " as a joint project from the CEA, France, and the Uppsala University, Sweden, Dr. Galy worked as a scientific researcher in the Joint Research Centre of the European Commission at the Institute for Transuranium Elements (ITU), Germany. There he combined his nuclear data expertise and his IT knowledge to contribute to the development of the Nuclides.net the first web-based environment for data and calculations on radionuclides and radiations, and later in launching the Nucleonica portal. As an expert is also an expert in scientific programming, he was one of





the major developers of Nucleonica modules such as the Dosimetry and Shielding module, webKORIGEN, the Range and Stopping Power module, and more. Since 2006, he is one of co-authors of the "Karlsruhe Nuclide Chart", which has for almost 50 years, provided scientists and students with structured, accurate information on the half-lives and decay modes of radionuclides, as well as the energies of emitted radiation.

He is as well co-author of the book "Radioactivity, Radionuclides Radiation", a book for teachers and students of topical environmental and human health radiological fields of study. His scientific accomplishments have been awarded by the French Nuclear Society and the JRC awards.

Since 2007, he has joined the Nuclear Safeguard and Security unit of the ITU (renamed Nuclear Safeguard and Forensics in 2011) in the team in charge of combating illicit trafficking of radioactive and nuclear material activities. He is the project coordinator of the "TACIS Multi-Country Project on Combating Illicit Trafficking" and in particular with the matters in relation with the Russian Federation. This project management covers: Analytical and Metrological Support to NMAC with the Russian Federation, the implementation of measures to combat illicit trafficking of radioactive and nuclear material in a multi-country project (Russian Federation, Ukraine, Moldova, Georgia and Azerbaijan), and enhancing the capability for analysis of seized nuclear and radiological material (NRM) with Ukraine. The projects aim on the one hand to assist the partner countries in establishing and upgrading measurement capabilities in the above described objectives (e.g. in Ukraine and Russian Federation), and on the other hand to develop, implement and validate a national response plan in the beneficiary countries (e.g. Multi-Country Project). The latter shall also promote international cooperation in the fight against illicit trafficking of NRM.

Additionally he is the project leader for the implementation of the European nuclear security training centre (EUSECTRA) – following the EU CBRN Action Plan -which aim to improve Member States capabilities to address the threats associated with illicit incidents involving nuclear or other radioactive materials by providing hands-on training using real materials to front line officers, their management, trainers and other experts in the field.